REMARKS

Claims 1-13 are pending in the application. Claims 1-13 are rejected. All rejections and objections are respectfully traversed.

The Examiner rejected claims 1-13 under the judicially created doctrine of double patenting over claim 1 of U.S. Patent 6,546,135, "Method for representing and comparing multimedia content" issued to Lin et al., on April 8, 2003, in view of Lee, et al., (*Querying multimedia presentations based on content*, IEEE Trans. on Knowledge and Data Engineering, vol. 11, no. 3, May/June 1999.

First, the Examiner will note that the present application is a Continuation-in-Part of U.S. Patent 6,546,135.

Second, Lee is irrelevant to what is claimed. As explained below in the Applicants' traversal of the Examiner's 35 U.S.C. 103(a) rejection based on Lee, Lee never measures attributes of content entities. At page 362, Lee describes "querying presentation graphs using temporal operators." The invention ***assigns*** measured attributes to each corresponding content entity in the directed acyclic graphs to rank order the multimedia content. Lee only queries the graph. The invention produces a graph having rank ordered content entities. Lee only queries graphs. Lee never describes any steps to produce a directed acyclic graph having rank ordered content entities as claimed. The Examiner's reference to specifying paths using computational tree logic is a querying step and does not produce a directed acyclic graph, and is therefore irrelevant to the invention.

Further, the Examiner erroneously points to an order of appearance of video streams in a presentation as describing *rank* ordering. A *temporal* ordering has nothing to do with the *rank* ordering content entities based on measured attributes as claimed. Lee takes as input a graph with video streams having some *temporal* ordering. Ordering video streams *temporally* says nothing about the relative *rank* of the videos. Nowhere does Lee describe that the temporal order in which the videos appear in the presentation has anything to do with the relative rank of the videos.

Lee never changes the order of the video streams as they appear in the presentation, nor does Lee assign a rank order to the video streams. Lee never rank orders anything.

The invention orders multimedia content. Image or video multimedia content is segmented to extract objects. Features of the objects are then extracted and associated to produce content entities. The content entities are coded to produce directed acyclic graphs of the content entities, each directed acyclic graph representing a particular interpretation of the multimedia content. Attributes of each content entity are measured and the measured attributes are assigned to each corresponding content entity in the directed acyclic graphs to rank order the multimedia content.

Furthermore, there is no motivation for combining Lee with Lin, by Lee's own admission:

> In this paper, we assume that multimedia presentations are created and stored in the form of multimedia presentation graphs, which can be viewed as high level abstractions for multimedia presentations. Simply, a multimedia pres-

Lee is already handed his graph, Lee doesn't need Lin. Therefore, a terminal disclaimer is not required.

Claims 1-13 are rejected under 35 U.S.C. 103(a) as being unpatentable over Lee, et al., (*Querying multimedia presentations based on content*, IEEE Trans. on Knowledge and Data Engineering, vol. 11, no. 3, May/June 1999 – "Lee").

It should be noted that Lee was a primary reference, in combination with Miller, in the first office action dated July 17, 2003. The rejection was successfully traversed by the applicants and the Examiner withdrew the rejection and issued a new rejection based on completely different (and inapplicable) art. That rejection was successfully traversed, and now the Examiner has produced Lee again, with no other support, in yet another 35 U.S.C. 103(a) rejection.

MPEP 707.07 explicitly states "Piecemeal examination should be avoided as much as possible." Further, MPEP 904.03 states "In all references considered, including nonpatent, foreign patents, and domestic patents, the examiner should study the specification or description sufficiently to determine the full value of the reference disclosure relative to the claimed or claimable subject matter."

It appears that the Examiner is attempting to inappropriately "stretch" the Lee reference, which is resulting in excessive prosecution efforts by the applicants.

Lee is now applied by the Examiner with no other supporting reference, but coupled with a statement that "it would have been obvious to rank order" in view of Lee. MPEP 7070.07(g) states "Where a major technical rejection is proper, it

should be stated with a full development of reasons rather than by a mere conclusion coupled with some stereotyped expression." The rejection by the Examiner is a mere conclusion, without a full development of reasons. The Examiner has repeatedly failed to produce prior art teaching the invention, and the applicants respectfully request the Examiner to allow the application instead of continuing to unnecessarily prolong the prosecution based on multiple interpretations of inapplicable references in an attempt to "fit" the reference to the claim.

The Examiner should understand at this point, as stated in the response to the first office action, that Lee can only begin after the invention is finished. The invention ***generates*** graphs of multimedia content. Lee *queries* already existing graphs of multimedia presentations for content. Lee is totally silent on how and where the graphs were created and stored.

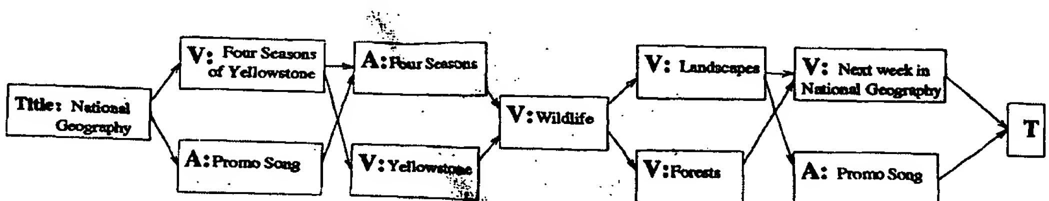
Lee describes an object-oriented programming language for *querying* content of graphical presentations; see page 361, right column, lines 17-22 – page 362, left column, lines 1-3, below:

> In this paper, we assume that multimedia presentations are created and stored in the form of multimedia presentation graphs, which can be viewed as high level abstractions for multimedia presentations. Simply, a multimedia presentation graph specifies the playout order of various types of streams making up the multimedia presentation, i.e., it is
>
> a visual specification of a *presentation plan.* Using a graph model for presentations, this paper discusses languages for *querying* multimedia presentation graphs.

Lee never produces graphs. Lee takes graphs as input. A person of ordinary skill in the art would know that querying a graph can never describe segmenting

multimedia content, extracting objects, extracting features of objects, associating the extracted features of the objects to produce content entities, coding content entities to produce directed acyclic graphs of the content entities, measuring attributes of each content entity, or assigning the measured attributes to each corresponding content entity in the directed acyclic graphs to rank order the multimedia content. The multimedia querying described by Lee is useless for making the invention obvious.

The input to Lee is a graph. Lee can never describe segmenting the multimedia content to extract objects as claimed. Lee just queries the graph. Lee never segments anything. Figure 1 of Lee shows a presentation graph, nothing more. The presentation graph shows an arrangement of video and audio streams that make up a presentation. Lee never describes segmenting multimedia content or extracting objects as the Examiner asserts.



A denotes audio; V denotes video.

Fig. 1. A multimedia presentation graph.

The Examiner has mischaracterized the labels of the boxes in Figure 1 of Lee. A person of ordinary skill in the art would never confuse an object extracted from multimedia content as claimed, with a manually assigned title of a video stream.

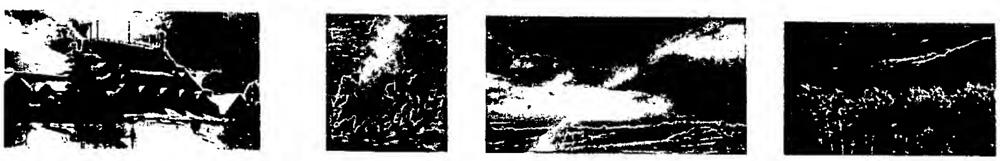
Even Lee refers to the video streams by title, see below:

> streams. Fig. 1 gives an example of a simple presentation graph entitled "National Geography" consisting of video streams "Four Seasons of Yellowstone", "Yellowstone", "Wildlife", "Landscapes", "Forests", and "Next week in National Geography", and audio streams "Promo Song" and "Four Seasons". In this paper, we illustrate our contributions using only the video multimedia data type.

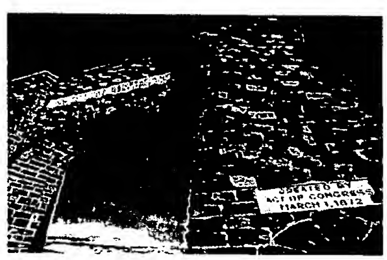
There is no description, suggestion, or even a hint that the titles in Figure 1 are somehow extracted from the content of the videos.

The only way that Lee could extract the title would be to study the video content, such as these exemplary Yellowstone seasonal scenes, and extract the weather features:

Winter Spring Summer Fall



and detect the winter snows, and then watch the winter change to spring, summer an fall, as the color of the leaves change, and then analyze a scene of the park entrance,



and then Lee's 'multimedia database system' says, aha, from my in-depth analysis of scenes in the content of this video, it is obvious to this very clever multimedia database system that the content clearly indicates that the title of this video must be:

"Four seasons in Yellowstone"

Applicants are skeptical that this is the case, and that Lee's multimedia database system has this capability. The invention does.

The Examiner's depiction of video stream titles as extracted video objects is clearly erroneous. Therefore, the rejection should be reconsidered and withdrawn, because Lee never segments multimedia content, or extracts objects as claimed.

Claimed is extracting and associating ***features*** of the objects to produce content entities. Therefore, each content entity is made up of different associated features of each object. For feature extraction, the Examiner points to Lee at page 362, left column, second full paragraph, below:

> A multimedia video stream consists of a sequence of video frames, each of which is associated with some *content* information, namely, a set of content objects and content relationships among its content objects. So, our object-oriented data model includes presentation graph, stream, frame and content-object classes whose objects represent, respectively, multimedia presentation graphs, multimedia streams, video frames, and content objects. Presentation node is also a class and inherits attributes of the stream class.

There is no description of extracting or associating features, above. Lee describes an object oriented data model that includes classes for graphs, video streams, frames and content objects. Lee's data model is used for querying content and has nothing to do with feature extraction or association.

The Examiner is requested to specifically point out exactly which words mean extracting and associating features of the objects to produce content entities, as claimed.

The invention codes the content entities to produce directed acyclic graphs (DAG) of the content entities, each directed acyclic graph representing a particular

interpretation of the multimedia content. Lee never produces DAGs. Lee only ***queries*** DAGs that were assumedly handed to him. Lee never generates DAGs representing interpretations of multimedia content based on content entities. Lee produces query results. Lee is useless for making the invention obvious.

As stated above, Lee takes as input a graphical representation of a multimedia presentation. There is no description of generating graphs anywhere in Lee. Lee is silent on content entities according to the invention, segmentation, and measured attributes associated with corresponding edges. According to Lee "Each presentation stream is a node in the presentation graph and edges describe sequential or concurrent playout of streams." See page 363, right col., $3^{rd}/4^{th}$ paragraphs. The Examiner is respectfully requested to explain exactly which words at page 363, right col., $3^{rd}/4^{th}$ paragraphs, mean coding content entities to produce directed acyclic graphs of the content entities. This is impossible for Lee, because Lee never extracts objects from multimedia content, and Lee never extracts and associates features from extracted objects to produce the content entities that are coded as claimed. Lee is irrelevant to what is claimed.

The invention measures attributes of each content entity and assigns the measured attributes to each corresponding content entity in the directed acyclic graphs to rank order the multimedia content. So the output of the invention is directed acyclic graphs including rank ordered content entities. The Examiner's repeated assertion that the text in Lee stating "a multimedia presentation graph specifies the playout order of various types of streams making up the multimedia presentation" suggests rank ordering the multimedia is nonsensical. Playout order is simply a temporal order by which each video stream is played so that the presentation makes sense, e.g., part one is played before part two. Temporal playout order of

video streams never suggests attribute based rank order of content entities in a DAG. The rejection makes no sense and should be reconsidered and withdrawn.

Regarding claim 2, Figure 2 of Lee does not include the words intensity or order, increasing or decreasing, anywhere. Applicants respectfully request the Examiner explain how Fig. 2 even suggests intensity attributes or rank ordered attributes. Applicants cannot find any words that suggest intensity or rank ordered attributes in Figure 2.

```
class Pres_Graph type [
   name: String;
   other attributes;
   Nodes: {Pres_Node};
   Edges: {<Pres_Node>} ];

class Stream type [
   name: String;
   type: String;
   pres_time: Real;

frames: <Frame>;
no_of_frames: Integer;
topic: String;
date: Date;
other attributes];

class Pres_Node : inherits from Stream
type [
graph-in: Pres_Graph;
other attributes ];

class Frame type [
   name: String,
   objects: {C_Object};
   other attributes ];

class C_Object type [
   name: String;
   type: String;
   frame-in: Frame;
   other attributes ];

Notation: "{ }" denotes the set constructor, and "< >" denotes the sequence constructor.
```

Fig. 2. Data modeling of a presentation graph.

Regarding claim 3, the two special attributes described by Lee are *Nodes* and *Edges*. This has nothing to do with object direction and there is no suggestion to measure or assign the attributes.

Regarding claims 4 and 5, the same is true for temporal and spatial attributes. Lee compares queries to attributes. The Examiner is requested to specifically point to where Lee measures temporal or spatial attributes, assigns attributes, or rank orders content entities based on attributes. The Examiner point to temporal *operators*, which are a tool in object oriented programming applications. Operators have nothing to do with attributes.

In claims 6 and 7, the measured attributes are arranged in an increasing (claim 6) or decreasing (claim 7) rank order. The Examiner points again to Lee describing a playout order of a multimedia presentation. Lee has nothing to do with rank ordering as claimed. The invention traverses the multimedia content and summarizes the multimedia content according to the directed acyclic graph and the measured attributes assigned to the content entities. As stated above, Lee never measures or assigns attributes. Lee uses temporal operators, such as "*Next, Connected, Until*" to query a presentation. Lee begins where the invention ends.

In claim 8, the multimedia content is traversed according to the directed acyclic graph and the measured attributes assigned to the content entities. Lee searches graphs based on queries. Lee never describes assigned attributes. Lee never assigns anything to a content entity.

In claim 9, the multimedia content is summarized according to the directed acyclic graph and the measured attributes assigned to the content entities. Lee only queries multimedia presentations. Lee never summarizes multimedia content. The Examiner's reference to graph components at page 363 is irrelevant.

In claim 10, the multimedia content is a three dimensional video sequence. The Examiner's rejection of claim 10 is a clear indication that the Examiner is simply recycling the first office action. The rejection points to a section of Lee that does not exist. Rather, Applicants believe that the section is erroneously lifted from Miller, in the first office action, a reference already withdrawn by the Examiner.

In claim 11, nodes of the directed acyclic graphs represent the content entities and edges represent breaks in the segmentation, and the measured attributes are

associated with the corresponding edges. Lee never describes segmenting multimedia content. Further, Lee's edges represent the end of video streams. As claimed, edges represent breaks in the ***segmentation***.

In claim 12, at least one secondary content entity is associated with a particular content entity, and wherein the secondary content entity is selected during the traversing. The Examiner's rejection of claim 12 is yet another indication that the Examiner is simply recycling her first office action. The rejection again points to a section of Lee that does not exist. Rather, this section is also erroneously lifted from the now defunct Miller.

In claim 13, a summary of the multimedia is a selected permutation of the content entities according to the associated ranks. The Examiner's rejection of claim 13 is still another indication that the Examiner is simply recycling her first office action. The rejection again points to a section of Lee that does not exist. Rather, this section is also erroneously lifted from the now defunct Miller.

In view of the foregoing, it is respectfully submitted that the application is in condition for allowance and an early indication of the same is courteously solicited. The Examiner is respectfully requested to contact the undersigned by telephone at the below listed telephone number, in order to expedite resolution of any remaining issues and further to expedite passage of the application to issue, if any further comments, questions or suggestions arise in connection with the application.

To the extent necessary, a petition for an extension of time under 37 C.F.R. § 1.136 is hereby made. Please charge any shortage in fees due in connection with the

filing of this paper, including extension of time fees, to Deposit Account 50-0749 and please credit any excess fees to such deposit account.

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